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(21)Application number : 10-255483 (71)Applicant : SONY CORP

(22)Date of filing : 09.09.1998 (72)Inventor : NAKATSUYAMA TAKASHI

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(54) MESSAGE DISTRIBUTION SYSTEM, INFORMATION CENTER, TERMINAL  
DEVICE AND MESSAGE DISTRIBUTION METHOD

(57)Abstract:

PROBLEM TO BE SOLVED: To avoid defective reproduction, etc., in real-time reproduction at the time of receiving data.

SOLUTION: A data transmission and reception system 1 is provided with a data transmitter 10 and a data receiver 20. Here, the transmitter 10 is provided with a data

retrieving processing means 13 retrieving data designated by data designating information from among plural data stored in a data storing means 12 and outputting it, a data separating means 14 separating data outputted from the means 13 into a summary part and an supplement part, and a data transmission and reception means 11 receiving data designating information for designating data and transferring in the order of the summary part and the supplement part concerning data separated from the means 14. On the other hand, the receiver 20 is provided with a data transmission and reception means 21 transmitting data designating information designating desired data to the transmitter 10 and successively receiving the summary part and the supplement part concerning separated data transferred from the transmitter 10, and a reproducing means 24 reproducing concerning at least the summary part of received and separated data.

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## CLAIMS

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[Claim(s)]

[Claim 1] It is the distribution system which distributes a program between the information centre estranged and arranged and a terminal unit. The above-mentioned information centre A storage means to accumulate two or more programs, and a data retrieval means to choose the program of the request chosen with the above-mentioned terminal unit from two or more programs accumulated in the above-mentioned storage means, As opposed to the program of the request chosen with the above-mentioned data retrieval means The outline data which can grasp the outline of the whole program, A separation means to separate into the complement data which can be restored to the original program by compounding with the above-mentioned outline data, It consists of a transmitting means to transmit the above-mentioned outline data

separated with the above-mentioned separation means, and the above-mentioned complement data to time sharing. Each terminal unit A receiving means to receive the above-mentioned outline data distributed from the above-mentioned information centre, and the above-mentioned complement data, The distribution system characterized by consisting of a synthetic means to compound the above-mentioned outline data received with the above-mentioned receiving means, and the above-mentioned complement data, and a playback means to perform monitor playback based on the above-mentioned outline data.

[Claim 2] The above-mentioned program consists of audio data. The above-mentioned separation means A conversion means to divide the above-mentioned audio data into two or more bands, and to decompose into a frequency component for every band, It has an encoding means to assign a quantization bit and to encode so that quantizing noise may be masked to the frequency component changed for every band with the above-mentioned conversion means. The distribution system according to claim 1 characterized by outputting the output of the encoding means corresponding to the band of one as outline data among the bands divided into the above-mentioned plurality, and outputting the output of the encoding means corresponding to other bands

as complement data.

[Claim 3] It is the distribution system according to claim 1 carry out the above-mentioned program consisting of audio data, and the above-mentioned separation means generating the addition output of two or more channels of the above-mentioned audio data, and the subtraction output of two or more channels of the above-mentioned audio data, outputting one side of the above-mentioned addition output and a subtraction output as outline data, and outputting considering another side as complement data as the description.

[Claim 4] It is the distribution system according to claim 1 characterized by consisting of conversion means for the above-mentioned program to consist of audio data, to spectrum-ize the above-mentioned separation means in the frequency domain of the above-mentioned audio data, and to output even number spectrum and odd number spectrum by turns, outputting one side of the above-mentioned even number spectrum and odd number spectrum as outline data, and outputting another side as complement data.

[Claim 5] It is the distribution system according to claim 1 characterized by for the above-mentioned program consisting of audio data, and for the above-mentioned separation means dividing the above-mentioned audio data

into vocal data and accompaniment data, outputting one side of the above-mentioned vocal data and accompaniment data as outline data, and outputting another side as complement data.

[Claim 6] It is the distribution system according to claim 1 characterized by continuing monitor playback of the above-mentioned outline data even if download of the above-mentioned complement data to the above-mentioned terminal unit from the above-mentioned information centre is started.

[Claim 7] Monitor playback of the above-mentioned outline data in the above-mentioned terminal unit is a distribution system according to claim 1 characterized by considering as no charge.

[Claim 8] The above-mentioned information centre is a distribution system according to claim 1 characterized by adding lock data to the above-mentioned complement data, transmitting to the above-mentioned terminal unit, and for the key data corresponding to the above-mentioned lock data coming to hand by performing accounting predetermined by the terminal unit side, and permitting playback of complement data.

[Claim 9] A storage means to be the information centre which distributes a program and to accumulate two or more programs in a terminal unit, A data

retrieval means to choose the program of the request chosen with the above-mentioned terminal unit from two or more programs accumulated in the above-mentioned storage means, A separation means to separate into the outline data which can grasp the outline of the whole program, and the complement data which can be restored to the original program by compounding with the above-mentioned outline data to the program of the request chosen with the above-mentioned data retrieval means, The information centre characterized by consisting of a transmitting means to transmit the above-mentioned outline data separated with the above-mentioned separation means, and the above-mentioned complement data to time sharing.

[Claim 10] The above-mentioned program consists of audio data. The above-mentioned separation means A conversion means to divide the above-mentioned audio data into two or more bands, and to decompose into a frequency component for every band, It has an encoding means to assign a quantization bit and to encode so that quantizing noise may be masked to the frequency component changed for every band with the above-mentioned conversion means. The information centre according to claim 9 characterized by outputting the output of the encoding means corresponding to the band of one

as outline data among the bands divided into the above-mentioned plurality, and outputting the output of the encoding means corresponding to other bands as complement data.

[Claim 11] It is the information centre according to claim 9 carry out the above-mentioned program consisting of audio data, and the above-mentioned separation means generating the addition output of two or more channels of the above-mentioned audio data, and the subtraction output of two or more channels of the above-mentioned audio data, outputting one side of the above-mentioned addition output and a subtraction output as outline data, and outputting considering another side as complement data as the description.

[Claim 12] It is the information centre according to claim 9 characterized by consisting of conversion means for the above-mentioned program to consist of audio data, to spectrum-ize the above-mentioned separation means in the frequency domain of the above-mentioned audio data, and to output even number spectrum and odd number spectrum by turns, outputting one side of the above-mentioned even number spectrum and odd number spectrum as outline data, and outputting another side as complement data.

[Claim 13] It is the information centre according to claim 9 characterized by for



the above-mentioned program consisting of audio data, and for the above-mentioned separation means dividing the above-mentioned audio data into vocal data and accompaniment data, outputting one side of the above-mentioned vocal data and accompaniment data as outline data, and outputting another side as complement data.

[Claim 14] The above-mentioned information centre is an information centre according to claim 9 characterized by adding lock data to the above-mentioned complement data, and transmitting to the above-mentioned terminal unit.

[Claim 15] The terminal unit carry out becoming from a synthetic means compound a receiving means receive the outline data which are the terminal unit which receives the program distributed from an information centre, and are distributed from the above-mentioned information centre, and complement data, and the above-mentioned outline data which received with the above-mentioned receiving means and the above-mentioned complement data, and a playback means perform monitor playback based on the above-mentioned outline data as the description.

[Claim 16] The program distributed from the above-mentioned information centre Consist of audio data, divide the above-mentioned audio data into two or more

bands, and it decomposes into a frequency component for every band. Coding which assigns a quantization bit so that quantizing noise may be masked to the frequency component changed for every band is carried out. The terminal unit according to claim 15 characterized by outputting the encoded sign corresponding to the band of one as outline data among the bands divided into the above-mentioned plurality, and outputting the encoded sign corresponding to other bands as complement data.

[Claim 17] it has further the decoding means which consists of a conversion means change the signal on a frequency shaft into the signal on a time-axis from the above-mentioned information centre to the above-mentioned outline data and the above-mentioned complement data which are distributed, and a band composition means compound the signal changed with the above-mentioned conversion means -- \*\* -- the terminal unit according to claim 15 characterized by things.

[Claim 18] It is the terminal unit according to claim 15 which the above-mentioned outline data and the above-mentioned complement data which are distributed from the above-mentioned information centre consist of an addition output of two or more channels, and a subtraction output of two or more

channels, and is carried out [ that the above-mentioned synthetic means returns the above-mentioned outline data and the above-mentioned complement data to the HARASHIN number by carrying out addition-and-subtraction processing, and ] as the description.

[Claim 19] It is the terminal unit according to claim 15 which the above-mentioned program consists of audio data, and the above-mentioned outline data distributed from the above-mentioned information centre and the above-mentioned complement data consist of the even number spectrum and odd number spectrum which were spectrum-ized, and is characterized by returning the above-mentioned synthetic means to the HARASHIN number with outputting the above-mentioned even number spectrum and odd number spectrum by turns.

[Claim 20] It is the terminal unit according to claim 15 which the above-mentioned program consists of audio data, and the above-mentioned outline data and the above-mentioned complement data which are distributed from the above-mentioned information centre consist of the vocal section and the karaoke section, and is characterized by the above-mentioned synthetic means compounding the above-mentioned vocal section and the karaoke

section.

[Claim 21] It is the terminal unit according to claim 15 characterized by continuing monitor playback of the above-mentioned outline data even if download of the above-mentioned complement data from the above-mentioned information centre is started.

[Claim 22] Monitor playback of the above-mentioned outline data is a terminal unit according to claim 15 characterized by considering as no charge.

[Claim 23] The terminal unit according to claim 15 characterized by receiving the above-mentioned complement data which lock data are added and are transmitted from the above-mentioned information centre, and for the key data corresponding to the lock data which carried out [ above-mentioned ] reception by performing predetermined accounting coming to hand, and permitting playback of the above-mentioned complement data.

[Claim 24] As opposed to the program of the request by which is the distribution approach which distributes a program between the information centre estranged and arranged and a terminal unit, and selection was made [ above-mentioned ] according to selection of a desired program with the above-mentioned terminal unit It separates into the outline data which can grasp the outline of the whole

program, and the complement data which can be restored to the original program by compounding with the above-mentioned outline data. The above-mentioned outline data and the above-mentioned complement data which carried out [ above-mentioned ] separation are transmitted to the above-mentioned terminal unit at time sharing. The distribution approach characterized by receiving the above-mentioned outline data and the above-mentioned complement data which are distributed from the above-mentioned information centre, compounding the above-mentioned outline data and the above-mentioned complement data which carried out [ above-mentioned ] reception, and performing monitor playback based on the above-mentioned outline data.

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[Translation done.]

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## DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention is used suitable for the data service system which distributes digital data, concerning a distribution system, an information centre, a terminal unit, and the distribution approach.

[0002]

[Description of the Prior Art] The data transceiver system built between a user side and a server side is proposed by development of the data compression technique over a video data or audio data, and development of the digital-signal-processing technique in the broadcast/communication link field. The above-mentioned data transceiver system is service which distributes the digital data called so-called VOD (Video On Demand) and MOD (Music OnDemand). And the MOD system which transmits and receives data with the Internet and a packet transmission system is proposed as an example of the above-mentioned data transceiver system.

[0003]

[Problem(s) to be Solved by the Invention] However, in such an MOD system, it was difficult to transmit digital data duly according to a limit of a transmission rate, generating of interruption data, etc. in many cases. For example, in the conventional MOD system, the case where the transfer rate of a communication line and a data transfer rate required for real-time playback of music data approached when transmitting music data to a data receiving side from a data source was often generated. In such a case, there was a trouble that playback of music data could not be performed unless it comes out, after it cannot realize continuation playback of audio data since the above-mentioned transfer rate adjoins if it is going to reproduce this music data simultaneously during download of the music data to a hard disk etc. by the data receiving side (henceforth real-time playback), or the above-mentioned download is completed actually.

[0004] Furthermore, in the conventional MOD system, a case which the data transfer rate which needs an average transfer rate for 22kbps(es) and real-time playback of music data calls [ the maximum transfer rate of a communication line ] 32kbps(es) by 28.8kbps(es) when transmitting music data to a data

receiving side from a data source was generated. In such a case, since the data transfer rate required for real-time playback had exceeded the transfer rate of a communication line, there was a trouble that real-time playback of the received data could not be carried out by the receiving side.

[0005] This invention is proposed in view of the above-mentioned actual condition, and aims at offering the distribution system which can avoid the poor playback in the real-time playback at the time of data reception, an information centre, a terminal unit, and the distribution approach.

[0006]

[Means for Solving the Problem] This invention is a distribution system which distributes a program between the information centre estranged and arranged and a terminal unit. The above-mentioned information centre A storage means to accumulate two or more programs, and a data retrieval means to choose the program of the request chosen with the above-mentioned terminal unit from two or more programs accumulated in the above-mentioned storage means, As opposed to the program of the request chosen with the above-mentioned data retrieval means The outline data which can grasp the outline of the whole program, A separation means to separate into the complement data which can



be restored to the original program by compounding with the above-mentioned outline data, It consists of a transmitting means to transmit the above-mentioned outline data separated with the above-mentioned separation means, and the above-mentioned complement data to time sharing. Each above-mentioned terminal unit It carries out becoming from a synthetic means to compound a receiving means to receive the above-mentioned outline data distributed from the above-mentioned information centre, and the above-mentioned complement data, and the above-mentioned outline data received with the above-mentioned receiving means and the above-mentioned complement data, and a playback means to perform monitor playback based on the above-mentioned outline data as the description.

[0007] Moreover, a storage means for this invention to be an information centre which distributes a program to a terminal unit, and to accumulate two or more programs, A data retrieval means to choose the program of the request chosen with the above-mentioned terminal unit from two or more programs accumulated in the above-mentioned storage means, A separation means to separate into the outline data which can grasp the outline of the whole program, and the complement data which can be restored to the original program by compounding

with the above-mentioned outline data to the program of the request chosen with the above-mentioned data retrieval means, It is characterized by consisting of a transmitting means to transmit the above-mentioned outline data separated with the above-mentioned separation means, and the above-mentioned complement data to time sharing.

[0008] Moreover, this invention is the terminal unit which receives the program distributed from an information centre, and it carries out becoming from a synthetic means compound a receiving means receive the outline data distributed from the above-mentioned information centre, and complement data, and the above-mentioned outline data received with the above-mentioned receiving means and the above-mentioned complement data, and a playback means perform monitor playback based on the above-mentioned outline data as the description.

[0009] Furthermore, this invention is the distribution approach which distributes a program between the information centre estranged and arranged and a terminal unit, and the program of the request by which selection was made [ above-mentioned ] is received according to selection of a desired program with the above-mentioned terminal unit. It separates into the outline data which can

grasp the outline of the whole program, and the complement data which can be restored to the original program by compounding with the above-mentioned outline data. The above-mentioned outline data and the above-mentioned complement data which carried out [ above-mentioned ] separation are transmitted to the above-mentioned terminal unit at time sharing. The above-mentioned outline data and the above-mentioned complement data which are distributed from the above-mentioned information centre are received, the above-mentioned outline data and the above-mentioned complement data which carried out [ above-mentioned ] reception are compounded, and it is characterized by performing monitor playback based on the above-mentioned outline data.

[0010]

[Embodiment of the Invention] It explains to a detail, referring to a drawing about the gestalt of the operation which applied this invention. The data transceiver system 1 shown in drawing 1 which applied this invention has the composition that the data source 10 which are the so-called music and a system for on demand one, and is a terminal unit by the side of a server, and the data sink 20 which is a terminal unit by the side of a user are connected through the

communication lines 30, such as the telephone line. Here, for example, the data control pin center, large by the side of a server etc. is equipped with the data source 10. On the other hand, a data sink 20 is installed in for example, each user's home etc. as a noncommercial use. In addition, although only one shows the data sink 20 for convenience by drawing 1, two or more data sinks 20 will be actually connected with the data source 10 by the side of a server through a communication line 30.

[0011] The data source 10 by the side of a server searches the data which receive the request information supplied from the data sink 20 by the side of a user through a communication line 30, and correspond based on the received request information, and is equipment which divides the searched data into outline data and complement data by the predetermined method, and transmits the data which separated to the above-mentioned data sink 20 through a communication line 30 in order of outline data and complement data.

[0012] The modem 11 which connects with the data sink 20 by the side of a user through a communication line 30, and transmits and receives data as this data source 10 is shown in drawing 1, The mass hard disk array 12 in which data, such as two or more music, were stored, The data retrieval processing section

13 which searches the above-mentioned data which carry out relevance from this hard disk array 12, It has the data separation section 14 which divides into outline data and complement data the data searched with this data retrieval processing section 13 by the predetermined method, and the control section 15 which performs control of the whole equipment, and is constituted.

[0013] A modem 11 receives the above-mentioned request information which the above-mentioned data sink 20 transmits, and supplies this request information to a control section 15 while connecting with a data sink 20 through a communication line 30. Moreover, a modem 11 transmits the outline data and complement data which are outputted from the data separation section 14 which mentions a detail later to a data sink 20 side one by one. In addition, each above-mentioned actuation of a modem 11 is performed based on the control signal from a control section 15.

[0014] The data of the music guide for searching the music data of the various genres for realizing music (MOD) on demand and desired music data, other voice data, etc. are stored in the hard disk array 12.

[0015] The data retrieval processing section 13 receives the request information from the data sink 20 received with the modem 11 through a control section 15,

and performs retrieval processing which searches the data which correspond out of data, such as much music stored in the hard disk array 12, based on this request information. And the data retrieval processing section 13 reads this corresponding data from the hard disk array 12, and outputs it to the data separation section 14. In addition, each above-mentioned actuation of the data retrieval processing section 13 is performed based on the control signal from a control section 15.

[0016] The data separation section 14 performs separation processing which divides into outline data and complement data the data supplied from the above-mentioned data retrieval processing section 13 with the predetermined method set up beforehand. And the data separation section 14 is equipped with the memory for once memorizing data, and about the data separated by the above-mentioned separation processing, it once memorizes complement data in the above-mentioned memory while it outputs outline data to a modem 11 first. And when the output of outline data is completed, the data separation section 14 reads the complement data memorized in the above-mentioned memory, and outputs them to a modem 11. In addition, each above-mentioned actuation of the data separation section is performed based on the control signal from a control

section 15.

[0017] Here, the following various methods are held as a concrete example of the method which divides data into outline data and complement data by the data separation section 14.

[0018] That is, the method which uses outline data as the audio data of the audio data +R (right) channel of L (left) channel, and uses complement data as the audio data of L audio data [ -R ] as the 1st example of the method which separates music data, for example is held.

[0019] Moreover, in a modulation [ in a frequency domain ], as the 2nd example of the separation method of music data, the method which makes outline data even number spectrum and makes complement data odd number spectrum is held. In addition, it is good in this case also as a method which changes weighting of each spectrum.

[0020] Furthermore, the method which uses as the data of a low-pass frequency domain the method which uses outline data as the data of a mid-range frequency domain, and uses complement data as the data of low-pass and a high region frequency domain as the 3rd example of the separation method of music data, or outline data, and uses complement data as the data of a high

region frequency domain is held.

[0021] The method which uses outline data as the data of vocal and uses complement data as the so-called data of karaoke as the 4th example of the separation method of music data further again is held.

[0022] Thus, as a separation method of data, the above various methods can be considered and a desirable thing can be suitably chosen according to a case. Moreover, as a separation method of data, the ratio of outline data and complement data does not necessarily need to be [ the data volume after 1 to 1, i.e., separation, ] 50% of 50% pairs.

[0023] Here, about the ratio of outline data and complement data, high quality data playback is attained at the time of the playback by the side of a data sink 20, so that the ratio of outline data is made [ many ], but on the other hand the case where real-time playback of outline data becomes impossible by the situation of a communication line 30 or relation with the modem 21 grade of a data sink 20 may arise. On the other hand, the above-mentioned real-time playback by the side of a data sink 20 is smoothly performed, so that the ratio of outline data is lessened, but on the other hand quality, such as voice reproduced at the time of this real-time playback, deteriorates. Therefore, what is necessary is just to



separate into outline data and complement data by the suitable ratio in the data source 10, after taking such a trade-off into consideration.

[0024] The audio data compressed as one example of this invention to the data sink 20 which is a terminal unit by the side of a user from the data source 10 which is a terminal unit by the side of a server are transmitted. As a compression method adopted, although an ATRAC (Adapted transform acoustic coding) method, a Twin-VQ (Transform domain Weighted Interleave Vector Quantization) method, a Real Audio method, MPEG(Moving Picture Experts Group) Layer2 method, etc. can be considered, an ATRAC method is adopted in the example of this invention.

[0025] Hereafter, an ATRAC method is explained using drawing 2 .

[0026] The audio compression circuit by the ATRAC method has realized high efficiency coding using each technique of the formation of a band part tally number (SBS:sub bandcoding), adaptive transform coding (ATC:adaptive transform coding), and adaptation bit assignment.

[0027] With the concrete high-efficiency-coding equipment shown in drawing 2 , while dividing an input digital signal into two or more frequency bands Coding within two or more two-dimensional blocks which carry out orthogonal

transformation of the signal and are related with time amount and a frequency for every frequency band, Obtain a part for the new composition for analysis, and the spectrum data of the acquired frequency shaft and on low-pass every [ in consideration of human being's acoustic-sense property mentioned later ] so-called critical band width of face (critical band) -- the crown -- in the region, for every band which subdivided critical band width of face in consideration of block floating effectiveness, bit assignment was carried out accommodative and it has encoded. Usually, this block turns into a quantizing noise generating block. Furthermore, in this example, the block size (block length) is changed accommodative according to an input signal before orthogonal transformation.

[0028] That is, in drawing 2 , a 0-22kHz audio signal is sampled by 44.1kHz, it is changed into a digital signal, and the audio PCM signal with which pulse code modulation of the digital audio signal was carried out, and it was obtained is supplied to an input terminal 100 as an input signal. This input signal is divided into the signal of a 0-11kHz band, and the signal of the band of a 11kHz - 22kHz band by the band division filters 101, such as the so-called QMF (Quadrature Mirror Filter). Similarly the signal of a 0-11kHz band is divided into the signal of a 0-5.5kHz band, and the signal of a 5.5kHz-11kHz band by the band division filters

102, such as QMF. The signal of the 11kHz - 22kHz band from the band division filter 101 is sent to the MDCT (Modified Discrete Cosine Transform) circuit 103 which is an example of a rectangular conversion circuit. The signal of the 5.5kHz - 11kHz band from the band division filter 102 is sent to the MDCT circuit 104, and MDCT processing of the signal of the 0-5.5kHz band from the above-mentioned band division filter 102 is carried out by being sent to the MDCT circuit 105, respectively. In addition, in each MDCT circuit 103,104,105, MDCT processing is made based on the block size (information-compression parameter) determined by the block decision circuit 109,110,111 prepared for every band.

[0029] Here, an example to the standard input signal about the block for every band supplied to each MDCT circuit 103,104,105 is shown in (A), (B), and (C). Three filter output signals have two or more orthogonal transformation block sizes (information-compression parameter) respectively independently for every band, and he is trying to have time resolution switched by the time amount property of a signal, frequency distribution, etc. in an example shown in this drawing 3 . a signal -- time -- semi- -- in being steady, it enlarges an orthogonal transformation block size like the long mode (long mode) in (A) for 11.6ms, i.e.,

drawing 3 , and when a signal is unsteady-like, an orthogonal transformation block size is considered as further 2 division and quadrisection. Like the short mode (Short mode) in (B) of drawing 3 , it is [ part ] adapted for a actual complicated input signal in a part by considering as quadrisection and the time resolution for 2.9ms for two division and 5.8ms like the case where all are set to 40 percent and 2.9ms, the middle mode A in (C) of drawing 3 (Middle Mode A), and the middle mode B in (D) of drawing 3 (Middle Mode B). If the magnitude of a processor allows division of this orthogonal transformation block size and still more complicated division will be performed, the more effective thing is clear.

[0030] make the decision of this block size (information-compression parameter) in the block decision circuit 109,110,111 in drawing 2 -- as the block-size information on the block concerned -- every -- while being told to the MDCT circuit 103,104,105 and the bit quota calculation circuit 118, it is outputted from an output terminal 113,115,117.

[0031] again -- drawing 2 -- set -- every -- in the spectrum data or the MDCT multiplier data (signal component within time amount and the two-dimensional block about a frequency) on the frequency shaft which MDCT processing be carried out in the MDCT circuit 103,104,105, and be acquired, it summarize

low-pass to every so-called critical band (critical band) -- have -- the crown -- in consideration of the effectiveness of block floating, a region subdivide critical band width of face, and be send to the adaptation bit allocation code-ized circuit 106,107,108 and the bit quota calculation circuit 118. This critical band is the frequency band divided in consideration of human being's acoustic-sense property, and is a band which a noise in case the mask of the pure sound concerned is carried out by the narrow-band band noise of the same strength near the frequency of a certain pure sound has. The perimeter wave number band which bandwidth is large and is above-mentioned 0-22kHz is divided into the critical band of 25 for this critical band (critical band) like the high region.

[0032] The bit quota calculation circuit 118 in drawing 2 The so-called masking effect etc. is taken into consideration based on block-size information and above-mentioned spectrum data, or above-mentioned MDCT multiplier data. Every division band in consideration of an above-mentioned critical band and above-mentioned block floating Energy or peak value for every amount of masking and isomerism rate band etc. is computed, and it asks for the allocation number of bits (the amount of bit allocation) for every band based on the result, and is transmitting to the adaptation bit allocation code-ized circuit 106,107,108.

[0033] In these adaptation bit allocation code-ized circuits 106,107,108, it is made to carry out re-quantization (for it to normalize and quantize) of each spectrum data or the MDCT multiplier data according to the number of bits assigned for each [ in consideration of block-size information, an above-mentioned critical band, and above-mentioned block floating ] division band of every. Thus, the encoded data are taken out through the output terminal 112,114,116 in drawing 2 . Every division band in consideration of the above-mentioned critical band of explanation which serves as a unit of bit assignment for convenience, and block floating is made to call a unit block below.

[0034] The high efficiency compression coding encoder explained using above-mentioned drawing 2 It is prepared in the interior of the data separation section 14 of drawing 1 , and compression processing is performed to the digital audio signal transmitted from the data retrieval processing section 13. The compressed data of the mid-range band outputted from the adaptation bit allocation code-ized circuit 107 of drawing 2 as an output which carried out band division is outputted as outline data. The compressed data of low-pass [ which is outputted from the adaptation bit allocation code-ized circuit 106 of drawing 2 and the adaptation bit allocation code-ized circuit 108 ] and a high region band is

outputted as complement data.

[0035] The control section 15 is equipped with the transmission-control program for transmitting data, such as corresponding music, to a data sink 20 by the predetermined separation method based on the above-mentioned request information from the data sink 20 sent through a communication line 30, and performs control of a modem 11, the data retrieval processing section 13, and the data separation section 14 based on this transmission-control program.

[0036] A control section 15 receives the request information transmitted from a data sink 20 through a communication line 30, and, specifically, controls a modem 11 to supply the received request information to a control section 15. A control section 15 supplies this request information to the data retrieval processing section 13 while once memorizing the request information supplied from the modem 11. In addition, a control section 15 extracts only the data specification information later mentioned from this request information, and you may make it supply it to the data retrieval processing section 13 at this time.

[0037] Moreover, a control section 15 controls the data retrieval processing section 13 to perform retrieval processing mentioned above based on the above-mentioned data specification information of the request information, to

read the searched data from the hard disk array 12, and to output to the data separation section 14.

[0038] Furthermore, a control section 15 performs separation processing mentioned above about the data supplied from the above-mentioned data retrieval processing section 13, outputs the outline data after separation to a modem 11, and controls the data separation section 14 by the predetermined method set up beforehand to make memory memorize the complement data after separation. And a control section 15 controls a modem 11 to transmit the outline data after the separation supplied from the data separation section 14 to a data sink 20 side with reference to the user ID information later mentioned of the request information. Furthermore, if transmission of outline data is completed, a control section 15 will read complement data from the memory of the data separation section 14, and will control the data separation section 14 and a modem 11 to transmit this complement data to a data sink 20 side. By this, in the data transceiver system 1, data will be transmitted from the data source 10 in order of outline data and complement data to a data sink 20.

[0039] It is equipment for the data sink 20 by the side of a user carrying out the sequential reception of the outline data and the complement data which are



transmitted from the data source 10 concerned based on this request information and which mentioned above, performing record and/or playback of the outline data concerned, compounding the above-mentioned outline data and the above-mentioned complement data further, generating [ transmit request information to the data source 10 by the side of a server based on a demand of a user, and ] complex data on the other hand, and carrying out record and/or playback of this complex data.

[0040] The modem 21 which connects with the data source 10 through a communication line 30, and transmits and receives data as this data sink 20 is shown in drawing 1 , The hard disk drive 22 for storing the above-mentioned outline data, complement data, or complex data (HDD), The merge section 23 for carrying out synthetic processing of outline data and the complement data, The regeneration section 24 which gives predetermined regeneration to the data outputted from the merge section 23, It has the output section 25 which consists of the loudspeaker which is not illustrated, a monitor, a headset jack, etc., the control section 26 which performs control of the whole equipment, and the actuation input section 27 which consists of a keyboard which is not illustrated for giving directions to a control section 26, a mouse, etc., and is constituted.

[0041] A modem 21 transmits the request information which mentions later the detail supplied from a control section 26 to a data source 10 side while connecting with the data source 10 through a communication line 30. Moreover, a modem 21 carries out sequential reception of the outline data and complement data which are transmitted from the data source 10 based on the above-mentioned request information, and supplies the received data concerned to HDD22 and the merge section 23. In addition, each above-mentioned actuation of a modem 21 is performed based on the control signal from a control section 26.

[0042] HDD22 can record now the above-mentioned outline data and complement data which come to have the hard disk which is not illustrated for storing outline data, complement data, or complex data, and are supplied from a modem 21 on this hard disk. Moreover, it connects with the merge section 23, and HDD22 reads the recorded complex data, the recorded above-mentioned outline data, or complement data, and supplies them to the merge section 23 while it records the complex data which mentions later the detail supplied from this merge section 23. In addition, each above-mentioned actuation of HDD22 is performed based on the control signal from a control section 26.

[0043] The merge section 23 corresponds to the data separation section 14 of the data source 10 mentioned above, and it has the memory for once memorizing data like the data separation section 14. This merge section 23 performs the following processings about the above-mentioned outline data and complement data which are transmitted from the data source 10 through a modem 21 based on the control signal from a control section 26.

[0044] The merge section 23 supplies this outline data to the regeneration section 24 while making the above-mentioned memory memorize the outline data supplied from a modem 21. Moreover, when complement data are supplied from a modem 21, the merge section 23 reads the outline data memorized in the above-mentioned memory, by performing complement data and processing to compound, generates complex data and outputs the generated complex data to the regeneration section 24. In addition, the merge section 23 outputs to the regeneration section 24 as it is about the data of one of the above supplied from HDD22, when reproducing the outline data recorded on the hard disk of HDD22, complement data, or complex data.

[0045] The concrete configuration of the merge section 23 of above-mentioned drawing 1 is shown in drawing 4 . This drawing 4 shows the decoder circuit

(decoder) for decrypting again the signal by which high efficiency coding was carried out by the system shown by drawing 2 mentioned above. The output signal of an output terminal 112,114,116 and the data of equivalence in the MDCT multiplier, i.e., drawing 2 , by which each band was quantized are given to the input terminal 207 in drawing 4 , and the output signal of an output terminal 113,115,117 and the data of equivalence in the used block-size information, i.e., drawing 2 , are given to the input terminal 208 in drawing 4 .

[0046] In the adaptation bit allocation decryption circuit 206 in drawing 4 , bit assignment is canceled using adaptation bit allocation information. Next, the signal on a frequency shaft is changed into the signal on a time-axis in the reverse orthogonal transformation (IDCT) circuit 203,204,205 in drawing 4 . The time-axis top signal of these partial bands is decrypted by the band composition filter (IQMF) circuit 202,201 in drawing 4 at all band signals. The signal compounded in the above-mentioned band composition filter circuit 202,201 is outputted from an output terminal 200. The signal outputted from the above-mentioned output terminal 200 is equivalent to the complex data outputted from the merge section 23 in drawing 1 .

[0047] Furthermore, it outputs through an output terminal 209 by using as outline

data the decoding result of the compressed data of the mid-range band obtained by the reverse rectangular cross conversion circuit 204. That is, the signal outputted from the above-mentioned output terminal 209 is equivalent to the outline data outputted from the merge section 23 in drawing 1 .

[0048] moreover, in the 1st example used as the L (left) channel-R (right) channel as an L (left) channel +R (right) channel and complement data as outline data In the merge section 23, a  $(\text{outline data} + \text{complement data})/2 = L$  (left) channel  $(\text{outline data} - \text{complement data})/2 = R$  (right) channel can restore L (left) channel and R (right) channel.

[0049] Processing of the merge section 23 in the 2nd example can restore the even number spectrum which is outline data, and the odd number spectrum which is complement data as complex data in arranging by turns. Furthermore, by interpolating using the above-mentioned even number spectrum (interpolation), playback of outline data generates odd number spectrum, and outputs it as outline data.

[0050] It is as having mentioned above about the 3rd example.

[0051] Furthermore, in the 4th example, restoration of complex data is attained by carrying out synthetic playback of the vocal section which is outline data, and

the karaoke section which is complement data.

[0052] By performing predetermined processing of extension processing, D/A transform processing, magnification processing, etc. to the outline data supplied from the merge section 23, complement data, or complex data based on the control signal from a control section 26, the regeneration section 24 generates the regenerative signal of an analog, and supplies this regenerative signal to the above-mentioned loudspeaker and headset jack of the output section 25. Thereby, in a data sink 20, an audio signal is outputted from the loudspeaker of the output section 25.

[0053] A control section 26 is constituted by the personal computer etc. This control section 26 is equipped with the control program for acquiring data, such as the above-mentioned music, from the data source 10 through a communication line 30, and controls the above-mentioned monitor of a modem 21, HDD22, the merge section 23, the regeneration section 24, and the output section 25 by performing this control program. In addition, it connects with the above-mentioned actuation input section 27, and a control section 26 performs each control in the above-mentioned control program based on the control input signal inputted by the above-mentioned keyboard of this actuation input section

27, and actuation of a mouse.

[0054] Specifically, a control section 26 controls a modem 21 to transmit to the data source 10 by making into data specification information information about data names, such as a genre name about data, such as music which a user wants, a player name, and a title name.

[0055] Moreover, a control section 26 controls a modem 21 to transmit the information (henceforth user ID information) about the user ID for identifying a user to the data source 10. The control section 26 registers the above-mentioned user ID beforehand by initial setting of a control program, and, specifically, controls a modem 21 to transmit the above-mentioned data specification information and the above-mentioned user ID information to the data source 10 at once as request information collectively.

[0056] In addition, after starting of the above-mentioned control program, it is the so-called GUI (Graphical UserInterface), for example. By technique, what is necessary is just made to perform the registration about the above-mentioned user ID, and the input of the above-mentioned data name to a control section 26 by operating the keyboard or mouse of the actuation input section 27 through the monitor of the output section 25. And a control section 26 generates user ID

information and data specification information from these user ID and a data name, and controls a modem 21 to transmit to the data source 10 at once by making these into request information.

[0057] Moreover, a control section 26 controls a modem 21, HDD22, the merge section 23, and the regeneration section 24 to perform the above regeneration, record processing to a hard disk, and synthetic processing with outline data and complement data about the outline data and complement data by which a sequential transfer is carried out from the data source 10 after transmission of this request information. In this way, the outline data about the received audio data are outputted from the loudspeaker of the output section 25 on real time, the continuation playback of audio data of them is attained in a data sink 20, and tone quality can do the monitor of music downloaded although it is not satisfying quality.

[0058] In the data transceiver system 1, when transmitting music data to a data sink 20 from the data source 10 For example, the maximum transfer rate of a communication line 30 is a data transfer rate (it is only hereafter called a playback rate.) which needs an average transfer rate for real-time playback of 22kbps(es) and music data at 28.8kbps(es). Even if it is a case so that real-time



playback cannot be performed in the former, such as 32kbps(es) For example, by the data source's 10 dividing this music data into the outline data about a low-pass frequency domain, and the complement data about a high region frequency domain, and transmitting to a data sink 20, the playback rate of the outline data of this music data can be set to 16kbps(es). Thereby, since the direction of the transfer rate of a communication line 30 has exceeded the playback rate of the above-mentioned outline data in the data transceiver system 1, when a data sink 20 reproduces this outline data, continuation playback of the audio data at the time of real-time playback is attained, and tone quality can do the monitor of music downloaded although it is not enough.

[0059] Next, it explains with reference to the timing diagram which shows the flow of the processing about the transmission and reception of data performed between the data sinks 20 and the data sources 10 in this data transceiver system 1 to the flow chart shown in drawing 5 , and drawing 6 .

[0060] The data sink 20 by the side of a user serves as input mode for generating the request information which consists of the above-mentioned data specification information and user ID information in step S1 after control program starting by controlling so that a control section 26 performs a predetermined

display to the monitor of the output section 25. Here, a user determines the genre of the data to demand, a player, a title, etc. by performing alter operation about the data name about data, such as music which a user wants, mentioned above. Thereby, while data specification information is generated by the control section 26 in a data sink 20, user ID information is generated from the user ID registered beforehand, and each [ these ] information is once memorized by the memory which a control section 26 does not illustrate as request information. And if this storage is completed, it will progress to step S2.

[0061] In step S2, a control section 26 reads the generated above-mentioned request information from the above-mentioned memory, and controls a modem 21 to transmit to the data source 10 through a communication line 30.

[0062] And when a control section 15 controls the data retrieval processing section 13 to search the corresponding data from the hard disk array 12 based on data specification information, the data source 10 by the side of the server which received this request information performs retrieval processing of data (step S3), and reads the searched data from the hard disk array 12.

[0063] the control section 15 of the data source 10 performs separation processing of data in continuing step S4 by controlling the data separation

section 14 so that the method of the 1st which mentioned above the data which searched with step S3 and carried out reading appearance thru/or the 4th example separates into outline data and complement data.

[0064] Furthermore, in continuing step S5, the control section 15 of the data source 10 performs control which makes the memory of the data separation section 14 memorize complement data while controlling the data separation section 14 and a modem 11 about the data concerned which performed separation processing by referring to user ID information to transmit outline data to the data sink 20 by the side of a user through a communication line 30 first.

[0065] And the control section 26 of a data sink 20 While controlling a modem 21 and making the received outline data memorize in the memory of the merge section 23 so that the outline data sent through a communication line 30 from the data source 10 may be received The merge section 23 is controlled to make this outline data output to the regeneration section 24, and the regeneration section 24 is controlled to perform predetermined processing mentioned above to the outline data further supplied from the merge section 23 (step S6). Thereby, as a data sink 20 is shown in (A) of drawing 6 , and (B), it is time of day t0. Each processing of reception of the outline data set and mentioned above, playback,

and storage will be started. Here, it sets to drawing 6 and (A) is carrying out the table of the content of processing of the data sink [ content / of processing / of the data sink 20 when the real playback time amount of outline data is shorter than the time of delivery of both outline data and complement data / (B) ] 20 when the real playback time amount of outline data is longer than the reception sum total time amount of both outline data and complement data, respectively.

[0066] And in a data sink 20, this outline data will be supplied to the output section 25 as a regenerative signal of an analog, and, in the case of the 3rd example, the audio output of a mid-range will be outputted from the loudspeaker of the output section 25.

[0067] In addition, when saving outline data here, a control section 26 should just control a modem 21 and HDD22 to record the outline data received with the modem 21 on a hard disk.

[0068] The control section 15 of the data source 10 will perform transmitting processing of complement data by controlling the data separation section 14 and a modem 11 to read the complement data memorized in the memory of the data separation section 14, and to transmit to a data sink 20, if transmission of the outline data in step S5 is completed (step S7).

[0069] and time of day t1 which the control section 26 of a data sink 20 which received this complement data carries out reading appearance of the outline data from the memory of the merge section 23, and is shown in (A) of drawing 6 , and (B) from -- processing which compounds the outline data which carried out reading appearance to the received above-mentioned complement data, and generates complex data is performed (step S8). Furthermore, this control section 26 controls the merge section 23 and HDD22 to supply the generated complex data to HDD22, and to record on the hard disk in HDD22 (step S9), and when the storing processing to the hard disk of this complex data is completed, it progresses to step S10.

[0070] A control section 26 performs the judgment about whether regeneration of outline data is completed in continuing step S10. It is the time of day t3 which is a case as specifically shown in (A) of drawing 3 , and the storing processing to the hard disk of complex data ended when it judged with regeneration of YES, i.e., outline data, being completed here. Since it set and regeneration of outline data is already completed, processing is terminated. It is the time of day t2 which is a case as specifically shown in (B) of drawing 6 , and the storing processing to the hard disk of complex data ended on the other hand when it judged with

regeneration of NO, i.e., outline data, not being completed. It is the case where set and the real playback time amount of outline data is not completed yet. In such a case, a control section 26 progresses to step S11 so that it may perform data playback of high quality more.

[0071] the above-mentioned time of day t2 which shows a control section 26 to (B) of drawing 6 in step S11 from -- time of day t3 which the real playback time amount of outline data completes up to -- the so-called high quality regeneration is performed by compounding outline data and complement data and reproducing in between. The approach of reproducing the complex data which controlled HDD22 and was stored in the hard disk as the approach of this high quality regeneration, the method of making the complex data which the memory of the merge section 23 was made to memorize complement data beforehand, controlled the merge section 23, compounded outline data and complement data, and generated and generated complex data output to the regeneration section 24, etc. are mentioned.

[0072] By this, in a data sink 20, this complex data will be supplied to the output section 25 as a regenerative signal of an analog, and the output of the audio signal restored to the fundamental tone to which the low compass and the

loud-sound region of popular music were joined from the loudspeaker of the output section 25 will be made. And a control section 26 is the time of day t3 shown in (B) of drawing 6 which this high quality playback completed. A series of processings set and mentioned above are terminated.

[0073] as mentioned above, since it is made to separate into outline data and complement data in the data transceiver system 1 about the data which the user specified and this is transmitted in order of outline data and complement data, the transfer rate from a transmitting side to a receiving side lowers, interruption and poor playback of the voice reproduced by the receiving side etc. can avoid, and the dependability of real-time playback can boil markedly and can raise.

[0074] Moreover, since the data transceiver system 1 is made to divide into outline data and complement data about the data which the user specified as mentioned above and this is transmitted in order of outline data and complement data, it can also perform easily building service of considering as no charge as the so-called sample data, for example about an outline data transfer, and considering as the charge about a complement data transfer. In this case, what is necessary is to add predetermined lock data for the data source 10 to forbid playback to this complement data, for example about a complement data

transfer, to transmit to a data sink 20, to acquire the key data corresponding to the above-mentioned lock data by performing procedure for accounting predetermined in a data sink 20, and just to consider as the configuration which enables playback of complement data by performing collating with the above-mentioned lock data and this key data.

[0075] In addition, since according to the data transceiver system 1 it was downloadable to the hard disk while the data sink 20 carried out the content check of the data requested during reception of outline data, when mistaken data are requested, or when it can cancel easily in the middle of download and complement data are made into the charge as mentioned above, evil does not happen.

[0076] In addition, in the gestalt of operation mentioned above, although the example of 1 configuration of the system of MOD was explained, as for this invention, it is needless to say for it to be able to apply also about the system which is not limited to this and distributes what kind of digital data about the so-called multimedia information, such as VOD, and still picture data, text data, program data.

[0077] For example, when applying this invention to the system which distributes



image data, the method which uses for example, outline data as the data about an even number raster, and uses complement data as the data about an odd number raster as a method which divides image data into outline data and complement data by the data separation section 14 is held. Moreover, the method which uses outline data as data of even frames, and uses complement data as the data of an odd frame as a separation method of image data is held. Furthermore, the method which uses outline data as the data of a low-pass frequency domain, and uses complement data as the data of a high region frequency domain as a separation method of image data is held. The method which uses outline data as the data of a monochrome image, and uses complement data as the data of a color picture as a separation method of image data further again is held.

[0078] Furthermore, although complement data are gathered at once and sent, this invention is not limited to this and you may make it send complement data in several steps in the gestalt of operation mentioned above. namely, -- for example, the thing for which image data is assigned as outline data and it assigns the caption of the above-mentioned image data as complement data in applying this invention to the system which distributes the image data mentioned

above -- or it is also possible to transmit the complement data of multiple times for assignment to one outline data transfer by [ this ] supposing that it is reverse. Moreover, it becomes assigning the low-pass area part of the music data which the artist used as outline data performed, assigning the high-pass area part of this music data as 1st complement data, assigning the image data of this artist's jacket photograph as 2nd complement data, and assigning the data about this artist's profile information, concert information, etc. as 3rd complement data, and possible to build service of various gestalten of \*\*.

[0079] Although the 1st example of the above described the example which uses as the audio data of a L+R channel as outline data, and is used as the audio data of a L-R channel as complement data, it considers as the audio data of a L-R channel as outline data, and is good also as audio data of a L+R channel as complement data. Moreover, it cannot be overemphasized that it is applied to the audio data of not only two channels but two channels or more.

[0080] Furthermore, although the 2nd example described the example which uses as the audio data of even number spectrum as outline data, and is used as the audio data of odd number spectrum as complement data, it considers as the audio data of odd number spectrum as outline data, and is good also as audio

data of even number spectrum as complement data.

[0081] Furthermore, although the 4th example of the above described the example which uses as the audio data of vocal as outline data, and is used as the audio data of karaoke as complement data, it considers as the audio data of karaoke as outline data, and is good also as audio data of vocal as complement data.

[0082]

[Effect of the Invention] In the distribution system which distributes a program between the information centre estranged and arranged and a terminal unit according to this invention as explained to the detail above As opposed to the program of the request by which selection was made [ above-mentioned ] from the above-mentioned information centre according to selection of a desired program with the above-mentioned terminal unit Since it separates into the outline data which can grasp the outline of the whole program, and the complement data which can be restored to the original program by compounding with the above-mentioned outline data and the above-mentioned outline data and the above-mentioned complement data which carried out [ above-mentioned ] separation are transmitted to time sharing In a terminal unit

side, the above-mentioned outline data and the above-mentioned complement data which are distributed from the above-mentioned information centre are received. The above-mentioned outline data and the above-mentioned complement data which carried out [ above-mentioned ] reception can be compounded, and monitor playback can be performed based on the above-mentioned outline data. Even when the ready-for-receiving ability transfer rate by the side of a terminal unit is low, the digest playback which the program which is downloading by receiving outline data previously followed is attained.

[0083] The information centre concerning this invention can divide into the outline data which can grasp the outline of the whole program, and the complement data which can restore to the original program by compounding with the above-mentioned outline data to the program of the request by which selection was made [ above-mentioned ] according to selection of a desired program with a terminal unit, and the above-mentioned outline data and the above-mentioned complement data which carried out [ above-mentioned ] separation can transmit to time sharing.

[0084] Moreover, the terminal unit concerning this invention can receive the outline data and complement data which are distributed from an information

centre, can compound the above-mentioned outline data and the above-mentioned complement data which carried out [ above-mentioned ] reception, and can perform monitor playback based on the above-mentioned outline data.

[0085] Furthermore, by the distribution approach concerning this invention, the program of the request by which selection was made [ above-mentioned ] is received according to selection of a desired program with a terminal unit. It separates into the outline data which can grasp the outline of the whole program, and the complement data which can be restored to the original program by compounding with the above-mentioned outline data. The above-mentioned outline data and the above-mentioned complement data which carried out [ above-mentioned ] separation are transmitted to the above-mentioned terminal unit at time sharing. Since the above-mentioned outline data and the above-mentioned complement data which are distributed from the above-mentioned information centre are received, the above-mentioned outline data and the above-mentioned complement data which carried out [ above-mentioned ] reception are compounded and monitor playback is performed based on the above-mentioned outline data Even when the

ready-for-receiving ability transfer rate by the side of a terminal unit is low, the digest playback which the program which is downloading by receiving outline data previously followed is attained.

[0086] The description of this invention separates outline data and complement data from an information center, is transmitting outline data ahead of complement data, and is that it can perform monitor playback of outline data with the terminal unit of a receiving side. Furthermore, although not partial regeneration but the tone quality of only the prelude of the music which transmits outline data, an interlude, and after \*\* are bad, it is excellent in the point that playback to the whole music can be performed.

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## DESCRIPTION OF DRAWINGS

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### [Brief Description of the Drawings]

[Drawing 1] It is the block diagram showing the example of 1 configuration of the data transceiver system which applied this invention.

[Drawing 2] It is the block diagram showing the concrete example of a configuration of the encoding section of high efficiency coding adopted in the above-mentioned data transceiver system.

[Drawing 3] It is drawing showing the frequency-time amount property of the orthogonal transformation block in the above-mentioned high-efficiency-coding equipment.

[Drawing 4] It is the block diagram showing the concrete example of a configuration of the decoding section of high efficiency coding adopted in the

above-mentioned data transceiver system.

[Drawing 5] It is the flow chart which shows the procedure of the data distribution in the above-mentioned data transceiver system.

[Drawing 6] It is the timing diagram which shows the actuation by the side of the data sink in the above-mentioned data transceiver system, and (A) shows the content of processing of a data sink [ content / of processing / of a data sink when the real playback time amount of outline data is shorter than the time of delivery of both outline data and complement data / (B) ] when the real playback time amount of outline data is longer than the reception sum total time amount of both outline data and complement data, respectively.

[Description of Notations]

1 Data Transceiver System, 10 Data Source, 20 Data Sink, 30 11 Communication Line, 21 Modem, 12 Hard Disk Array, 13 Data Retrieval Processing Section, 14 Data Separation Section, 15 Control Section, 22 HDD, 23 Merge Section, 24 Regeneration Section, 25 Output Section, 26 Control Section, 27 Actuation Input Section



